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Effects of graphene on electro-optic response and ion-transport in a nematic liquid crystal DANIEL KINNAMON, ALFRED GARVEY, RAJRATAN BASU, US Naval Academy — A small quantity of graphene flakes was doped in a nematic liquid crystal (LC), and the nematic electro-optic switching was found to be significantly faster in the LC+graphene hybrid than that of the pure LC. Additional studies revealed that the presence of graphene reduced the free ion concentration in the nematic media by ion-trapping process. The reduction of mobile ions in the LC was found to have subsequent impacts on the LC's conductivity and rotational viscosity, allowing the nematic director to respond faster on switching the electric field on and off.

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